

WHAT IS CLAIMED IS:

Claim 1: A display device for displaying display data, comprising:
a display panel having pixel sections arranged in a matrix form;
a scanning circuit which selects a line of the pixel sections;
a gray-scale voltage generation circuit which generates a plurality of gray-scale voltages based on reference voltages; and
a selection circuit which selects a gray-scale voltage corresponding to the display data from the plurality of gray-scale voltages, and outputs a selected gray-scale voltage to a pixel section of the display panel,
wherein current values of the gray-scale voltage generation circuit are changed according to a load of the display panel.

Claim 2: The display device according to claim 1, wherein the current values of the gray-scale voltage generation circuit become larger as the load of the display panel becomes larger.

Claim 3: The display device according to claim 1, further comprising:
a conversion circuit which converts histogram data indicating frequencies for every one or more gray-scales of the display data into converted histogram data according to the load of the display panel,
wherein the current values of the gray-scale voltage generation circuit are changed according to the converted histogram data.

Claim 4: The display device according to claim 3, further comprising:

a display memory for storing the display data; and
a histogram memory for storing the converted histogram data,
wherein the histogram memory outputs the converted histogram data at a
timing when the display memory outputs the display data.

Claim 5: The display device according to claim 3, further comprising a
detection circuit which detects the frequencies for every one or more gray-scales of
the display data, thereby to generate the histogram data.

Claim 6: The display device according to claim 3, wherein the
conversion circuit converts the histogram data by calculating the histogram data with
offset data according to the load of the display panel.

Claim 7: The display device according to claim 6, further comprising
registers for setting therein offset data according to the load of the display panel.

Claim 8: The display device according to claim 7, wherein the gray-
scale generation circuit includes:

buffer circuits for buffering the reference voltages;
resisters for dividing buffered reference voltages, thereby to output the
plurality of gray-scale voltages, and
the current values of the buffer circuits are changed according to the
converted histogram data converted by using the offset data.

Claim 9: The display device according to claim 8, wherein the buffer circuits control current values by calculating bias currents for controlling currents of the buffer circuits with the converted histogram data converted by using the offset data.

Claim 10: The display device according to claim 1, further comprising:
registers for setting therein gain data according to the load of the display panel, wherein the gray-scale generation circuit includes:

buffer circuits for buffering the reference voltages; and
resistors for dividing buffered reference voltages, thereby to output the plurality of gray-scale voltages, wherein current values of the buffer circuits are changed according to the gain data.

Claim 11: The display device according to claim 10, wherein the buffer circuits control current values by calculating bias currents for controlling currents of the buffer circuits with the gain data.

Claim 12: The display device according to claim 1, wherein:
the gray-scale voltage generation circuit includes a plurality of generating circuits each generating a corresponding one of the gray-scale voltages, and
a current value of each of the generating circuits is changed according to the load of the display panel.

Claim 13: The display device according to claim 1, wherein the load of

the display panel is defined by a steady-state current value of the display panel.

Claim 14: A display device for displaying display data, comprising:

- a display panel having pixel sections arranged in a matrix form;
- a scanning circuit for selecting a line of the pixel sections;
- a gray-scale voltage generation circuit for generating a plurality of gray-scale voltages based on reference voltages; and
- a selection circuit for selecting a gray-scale voltage to be applied to each of the pixel sections, from the plurality of gray-scale voltages,

wherein the gray-scale voltage generation circuit includes a plurality of voltage generating circuits for generating respective gray-scale voltages; and

wherein a quantity of current of each of the voltage generating circuits is changed according to a frequency of a corresponding gray-scale voltage.

Claim 15: A display device according to claim 14, further comprising:

- a detection circuit for detecting a quantity of current of each of gray-scale voltages to be applied to the display panel, and calculating a frequency of each of the gray-scale voltages every line of the pixel sections; and
- a histogram memory for storing a frequency of each of the gray-scale voltages;

wherein the detection circuit detects a quantity of current of each of the gray-scale voltages during a first interval in one scanning interval of the scanning circuit, and

wherein the gray-scale voltage generation circuit controls a quantity of current

of each of the plurality of voltage generating circuits during a second interval in said one scanning interval.

Claim 16: A display driving device according to claim 14, wherein the gray-scale voltage generation circuit comprises buffer circuits for converting impedances of the reference voltages, in which an output quantity of current of each of the buffer circuits becomes larger as the frequency of the corresponding gray-scale voltage becomes large.

Claim 17: A display driving device according to claim 16, wherein the buffer circuits comprise a plurality of current sources, and switchover circuits for switching over quantities of current supplied to the current sources in accordance with frequencies of the gray-scale voltages.

Claim 18: A display driving device according to claim 16, wherein the buffer circuits comprise a plurality of current sources each having a quantity of current changed according a voltage, and switchover circuits for switching over voltages applied to the current sources in accordance with the frequency of the corresponding gray-scale voltage.

Claim 19: A display driving device according to claim 14, wherein the gray-scale voltage generation circuit makes a quantity of current of each of the voltage generating circuits large during a first interval in one scanning interval for applying the gray-scale voltages every the pixels sections to said display panel, and

makes a quantity of current of each of the voltage generating circuits small during a second interval in said one scanning interval.

Claim 20: A display driving device according to claim 15, wherein the frequency of the corresponding gray-scale voltage is generated by m high-order bits of the display data.